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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/761,296	01/22/2004	Miki Onaka	1344.1130	3083

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EXAMINER	
DIACOU, ARI M	
ART UNIT	PAPER NUMBER
3663	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/10/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/761,296	ONAKA ET AL.	
	Examiner	Art Unit	
	Ari M. Diacou	3663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 October 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☒ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. In the remarks filed 10-16-2006, applicant argued the following:

   A. On page 1, that "the claimed polarization control section does not correspond to the polarized-wave identifying/synthesizing unit 3 of Kosaka because the unit 3 is not provided with the function of making specific polarization states variable. To the contrary, the unit 3 of Kosaka et al. fixes the signal lights to a specific polarization state."

   B. On page 1, that "The controller 10 in Kosaka, which the Examiner alleges to correspond to the claimed control section, does not control unit 3 (which the Examiner alleges to correspond to the claimed polarization control section) as recited in claim 1."

   C. On page 1, that "It was urged that Kosaka et al. does not teach or suggest the claimed monitoring section that monitors a polarization mode dispersion generation state of the signal light output from the polarization mode dispersion generation section."

2. Arguments A, B and C are unconvincing, because the claims, as presently written, include functional language which is broad enough to read on the prior art of record. Applicant have been advised that the following amendments will overcome the prior art.

Page of Claims	Line	Regarding Claim	Change
1	8	1	~~controls~~ is configured to control
1	11	1	~~capable of~~ set to
1	14	1	~~applies~~ is configured to apply
1	17	1	~~monitors~~ is configured to monitor
1	19	1	~~controls~~ is configured to control
5	14	18	~~controls~~ is configured to control
5	18	18	~~applies~~ is configured to apply
5	20	18	~~monitors~~ is configured to monitor
5	22	18	~~controls~~ is configured to control

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 1-4, 9, and 12-14 and 18 are rejected under 35 U.S.C. 103(a) as being obvious over Kosaka et al. (USP No. 5943162) in view of Shimizu (USP 4898441).

5. Regarding Claim 1, Kosaka discloses: An optical amplifier having a polarization mode dispersion compensation function comprising:

- a polarization mode dispersion generation section that has an optical transmission medium which has birefringence capable of giving a differential group delay between orthogonal polarization mode components of the signal light controlled in said polarization control section, and which is doped with a rare earth element; [Fig 2, #4]
- a pumping light supply section that applies pumping light capable of pumping said rare earth element, to the optical transmission medium in said polarization mode dispersion generation section; [Fig 2, #6] [Col. 9, lines 12-15] [Col. 10, lines 64-67] [Col. 7, lines 11-16]

- a monitoring section that monitors a polarization mode dispersion generation state of the signal light output from said polarization mode dispersion generation section; [Fig 2, #9] [Col. 9, lines 25-27]
- and a control section that controls said polarization control section so that polarization mode dispersion monitored in said monitoring section is reduced. [Fig 2, #10] [Col. 9, lines 27-29, 52-56]

but fails to disclose:

- a polarization control section that controls a polarization plane angle of input signal light to produce variable polarization states;

Shimizu teaches a polarization controller that can control the output polarization ofa beam of light given an input with any polarization vector [Col. 2, lines 39-45]. Therefore, it would have been obvious to one skilled in the art (e.g. an optical engineer) at the time the invention was made, to replace the polarizers 12a and 12b of Kosaka with the polarization controller of Shimizu, for the advantage of controlling polarization without the loss of photons due to the use of a polarization filter.

6. Regarding Claim 18, Kosaka discloses: An optical amplifier having a polarization mode dispersion compensation function comprising:

- a polarization mode dispersion generation section having an optical transmission medium with a rare earth element; [Fig 2, #4]

- a pumping light supply section that applies pumping light to the optical transmission medium; [Fig 2, #6] [Col. 9, lines 12-15] [Col. 10, lines 64-67] [Col. 7, lines 11-16]
- a monitoring section that monitors a polarization mode dispersion generation state of the signal light output from said polarization mode dispersion generation section; and [Fig 2, #9] [Col. 9, lines 25-27]
- a control section that controls said polarization control section, so that polarization mode dispersion monitored in said monitoring section, is reduced. [Fig 2, #10] [Col. 9, lines 27-29, 52-56]

but fails to disclose:

- a polarization control section that controls a polarization plane angle of input signal light to produce variable polarization states;

Shimizu teaches a polarization controller that can control the output polarization ofa beam of light given an input with any polarization vector [Col. 2, lines 39-45]. Therefore, it would have been obvious to one skilled in the art (e.g. an optical engineer) at the time the invention was made, to replace the polarizers 12a and 12b of Kosaka with the polarization controller of Shimizu, for the advantage of controlling polarization without the loss of photons due to the use of a polarization filter.

7. Regarding Claim 3, Kosaka discloses: An optical amplifier having a polarization mode dispersion compensation function according to claim 1,

- wherein said monitoring section monitors the power of signal light output from said polarization mode dispersion generation section, [Fig 2, #9] [Col. 9, lines 27-29]
- and said control section controls said pumping light supply section so that the power of signal light monitored by said monitor section is fixed to be constant at a previously set value. [Fig 2, #10] [Col. 9, lines 27-29]

8. Regarding Claim 2, Kosaka discloses: An optical amplifier having a polarization mode dispersion compensation function according to claim 1,

- wherein said monitoring section monitors the power of signal light output from said polarization mode dispersion generation section, [Fig 2, #9] [Col. 9, lines 27-29]
- and said control section controls said pumping light supply section so as to obtain a gain which makes the power of signal light monitored by said monitor section to be the power at the time of input or above.

  [It is clear that the clause j. of this office action is a special case of clause h., and Kosaka's invention could perform this function.]

9. Regarding Claim 4, Kosaka discloses: An optical amplifier having a polarization mode dispersion compensation function according to claim 1,

- wherein said monitoring section monitors the power of signal light output from said polarization mode dispersion generation section, and said control section controls said pumping light supply section so as to obtain a gain which makes

the power of signal light monitored by said monitor section to be the power at the time of input or above. [Fig 5, #15] [Col 11, lines 21-24]

10. Regarding Claim 9, Kosaka discloses: An optical amplifier having a polarization mode dispersion compensation function according to claim 1, wherein said monitoring section comprises:

- a branching device which branches a part of the signal light output from said polarization mode dispersion generation section, as monitor light; [Fig 2, #8] [Col. 9, lines 24-33]
- an output monitor which monitors the power and polarization mode dispersion generation state of the monitor light branched by said branching device;
- and a pumping light interception device having a property for transmitting the signal light and intercepting the pumping light, which prevents leaked light of pumping light supplied to said polarization mode dispersion generating section from being input to said output monitor. [Fig 2, #5] [Col. 9, lines 12-24]

11. Regarding Claim 12, Kosaka discloses: An optical amplifier having a polarization mode dispersion compensation function according to claim 1,

- wherein an optical filter having a property for transmitting the signal light and intercepting the pumping light and amplified spontaneous emission light generated accompanying amplification of the signal light in said polarization mode dispersion generation section, is provided on an optical path through which the signal light is propagated. [Col 5, lines 51-57]

12. Regarding Claim 13, Kosaka discloses: An optical amplifier having a polarization mode dispersion compensation function according to claim 1,

- wherein when said polarization mode dispersion generation section is constructed by cascade connecting a plurality of optical transmission media having birefringence, a rare earth element is doped on at least the optical transmission media disposed on the signal light input side among said plurality of optical transmission media, [Fig 10]
- and said pumping light supply section supplies forward pumping light to the optical transmission media doped with the rare earth element, of said polarization mode dispersion generation section. [Fig 2, #5] [Col. 9, lines 17-19]

13. Regarding Claim 14, Kosaka discloses: An optical amplifier having a polarization mode dispersion compensation function according to claim 1,

- wherein when said polarization mode dispersion generation section is constructed by cascade connecting a plurality of optical transmission media having birefringence, a rare earth element is doped on at least the optical transmission media disposed on the signal light output side among said plurality of optical transmission media, [Fig 10]
- and said pumping light supply section supplies backward pumping light to the optical transmission media doped with the rare earth element, of said polarization mode dispersion generation section. [Fig 2, #5] [Col. 9, lines 17-19]

14. Claims 5-8 and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kosaka in view of Shimizu as applied to claim 1 above, and further in view of Sanders et al. (USP No. 6301273). Kosaka discloses an optical amplifier with all the limitations of claim 1, but fails to teach the application of the optical amplifier to a planar lightwave circuit. Sanders teaches an optical amplifier with a polarization mode compensation function and discloses the use of an erbium-doped waveguide, made in a substrate of lithium niobate. Therefore, it would have been obvious to one skilled in the art (e.g. an optical engineer) at the time the invention was made, to create an optical amplifier with the limitations and structure disclosed by Kosaka, but in the form of a planar photonic integrated circuit, for the purpose of modularity and miniaturization and all of the documented obvious advantages thereof.

15. Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kosaka et al. in view of Shimizu as applied to claim 9 above, and further in view of Hwang et al. (USP App. No. 10/854,347). Kosaka discloses an optical amplifier with all the limitations of claim 9, but fails to teach the functional equivalency of an isolator, a band-pass filter and a tap or a conventional optical fiber. Hwang teaches a wideband optical source composed of two fiber amplifiers with a plurality of connectors between them, including a mirror [Fig 2, #230], a filter [Fig 4, #432], an isolator [Fig 6, #630], and a coupler [Fig 3, #330]. Therefore, it would have been obvious to one skilled in the art (e.g. an optical engineer) at the time the invention was made, to substitute a filter [as in claim 10] or an isolator [as in claim 11] for an optically null component [as in claim 9]. As

substitution is no more than the use of conventionally known optical amplifier filtering means available in the optics art.

Conclusion

16. While patent drawings are not drawn to scale, relationships clearly shown in the drawings of a reference patent cannot be disregarded in determining the patentability of claims. See In re Mraz, 59 CCPA 866, 455 F.2d 1069, 173 USPQ 25 (1972).

17. The references made herein are done so for the convenience of the applicant. They are in no way intended to be limiting. The prior art should be considered in its entirety.

18. The prior art which is cited but not relied upon is considered pertinent to applicant's disclosure.

19. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ari M. Diacou whose telephone number is (571) 272-5591. The examiner can normally be reached on Monday - Friday, 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on (571) 272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AMD 1/4/2007

JACK KEITH
SUPERVISORY PATENT EXAMINER